

# PATENT SPECIFICATION

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## COMPLETE SPECIFICATION

### Improvements in or relating to Vial Breakers

I, JUAN ALBERTO VINYALS CAMPANY, a Spanish citizen, of Avd<sup>a</sup>, Virgen de Monserrat, 10, 1<sup>a</sup>, Barcelona, Spain, do hereby declare the invention, for which I pray that a patent may be granted to me, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to vial breakers.

More particularly, the invention is concerned with a device for breaking and opening vials made of glass or like material, containing diverse substances, for example injectable medicines, which vials are adapted to be opened by breaking a portion thereof after weakening a portion of their surface with a tool having abrasive points. Although the common application of such vials is to contain medicines, it is understood that the device hereinafter described can be utilized for opening vials containing substances of other nature.

The object of the invention is to provide an improved vial breaker which is efficient in operation and avoids the danger of the vial being unevenly broken and the user's hand hurt with the broken pieces such as it is commonly encountered with the devices at present in use.

These objects are attained by providing a vial breaker, more particularly for vials made of glass or the like material, adapted to be opened by breaking a portion thereof after weakening its surface by scratching the glass or like material by abrasive means, characterised in that the vial breaker has at least a portion thereof made of flexible or elastic material, and has a space or cavity suitable to contain a substantial portion of the vial, said space being provided with at least one opening for communication with the outside and including abrasive means for scratching the glass or like material, which opening is arranged for engagement with the vial surface portion where the rupture is desired to take place.

The end of said space or cavity opposite to said opening may be provided with a second opening to allow ejection of the vial piece which

is removed when opening the vial, or with a drill-hole having a diameter great enough to permit the insertion therein of a tool suitable to force such piece through the first mentioned opening.

The breaker body may be formed of two longitudinal pieces connected together so as to allow their engagement to form the closed cavity, or an equivalent intermediate space. This connecting means may consist of elastic material bands, suitable hinges or other devices providing the same effect.

The invention will now be described with reference to the accompanying drawings wherein:

Figure 1 is a plan view of one form of the device in which the body comprises two pieces and

Figure 2 is a cross-section on the line 2—2 of Figure 1.

In the embodiment illustrated, the breaker entirely embraces the vial portion which has to be removed from the remainder of the vial, the body of the breaker being formed of two pieces 10 and 11 connected together by a band 12 made of a substantially elastic material, or by means of hinges secured by the ends thereof to said pieces. If desired the connecting means 12 may be formed integral with the pieces 10 and 11.

Said pieces 10 and 11 have surfaces 13 and 14 which when said pieces are moved in the direction of the arrows 15, Figure 2, coincide with one another and join together the pieces referred to.

The surfaces 13, 14 have formed thereon recesses 16 and 17. These recesses have outlets 18 and 19 for communication thereof with the outside at one of the smaller faces 20 of the pieces. The outlets 18 and 19 have longitudinal dimensions suitable to the weakened portion which one desires to obtain on the vial in question and said outlets are provided with a coating 21 formed of abrasive particles such as Carborundum, a steel saw or a piece of con-

creted Carborundum, or other hard material.

It will be seen that when the pieces 10 and 11 are joined together as described, the recesses 16 and 17 coincide thereby constituting a space or cavity in which the vial is contained. When the vial is placed in the recesses 16, 17 and the pieces 10, 11 moved to the closed position, the coating 21 is applied strongly against the rupture zone. If now the vial or the breaker is given a coaxial rotary movement, the other element being simultaneously kept stationary, the said coating will scratch the rupture zone thereby weakening it enough to allow rupture to take place upon bending of the ensemble.

When the pieces 10 and 11 are moved apart due to the elasticity of the band 12, the vial piece or pieces which may be left retained within the space or cavity formed by the two recesses 16 and 17 can be ejected.

If the material employed for the body of the breaker is sufficiently elastic, and the difference in diameter between the rupture zone and the thicker portion of the vial tail which is being removed is not great, the device may be constituted as a single piece, in which event the vial is placed in breaking position by urging it to pass through the opening or mouth equivalent to the two outlets previously described. If the body of the breaker is made in two parts 10 and 11 these parts could be either of flexible or substantially hard material, connected by a band 12 of substantially elastic material.

In this connection it may be advisable to provide the breaker body with a second opening or mouth opposite to that previously described said second opening or mouth being large enough to permit ejection of the broken vial tail or the insertion therein through said mouth, of a tool suitable for ejecting it.

It will be obvious that various modifications such as shape and size, as well as suitable materials, can be utilized in the present invention without departing from the scope of the invention as defined in the appended claims.

What I claim is:—

1. Vial breaker, more particularly for vials

made of glass or the like material, adapted to be opened by breaking a portion thereof after weakening its surface by scratching the glass or like material by abrasive means, characterised in that the vial breaker has at least a portion thereof made of flexible or elastic material, and has a space or cavity suitable to contain a substantial portion of the vial, said space being provided with at least one opening for communication with the outside and including abrasive means for scratching the glass or like material, which opening is arranged for engagement with the vial surface portion where the rupture is desired to take place.

2. Vial breaker according to claim 1, wherein the end of said space opposite to said opening is provided with a mouth to allow ejection of the vial piece removed upon opening of the vial.

3. Vial breaker according to claim 2, wherein the mouth permits the insertion therein of a tool for urging the vial piece removed, towards the outside through said opening.

4. Vial breaker according to claim 1, comprising two pieces connected together by a means allowing the engagement of the same so as to constitute said space or an intermediate cavity providing the same effect.

5. Vial breaker according to claim 4, wherein said connecting means is formed integral with said pieces.

6. Vial breaker according to claim 4 wherein said connecting means acts as a pivot for the two pieces.

7. Vial breaker according to any one of claims 1 to 6, which is of a length such as to include the whole of the portion of the vial which is to be removed.

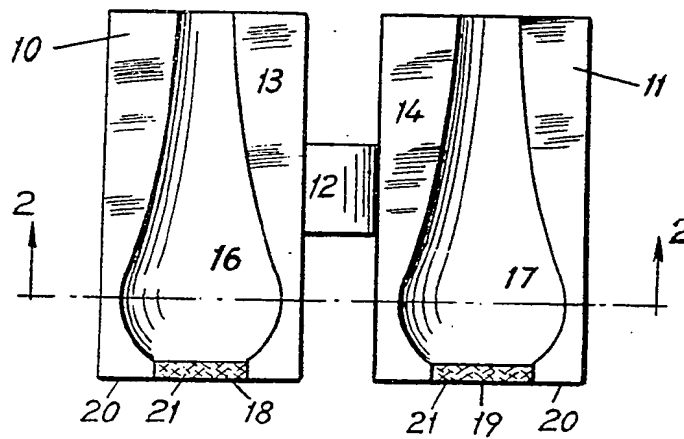
8. Vial breaker constructed arranged and adapted to operate substantially as hereinbefore described and illustrated on the accompanying drawings.

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Agents for the Applicants.

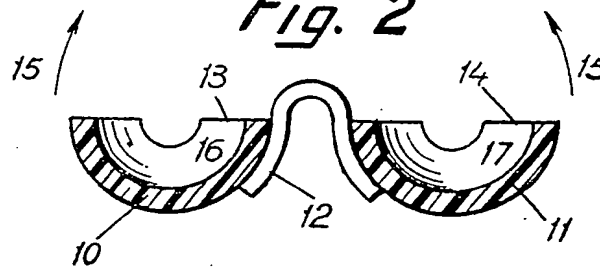
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*Fig. 1*



*Fig. 2*



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DOM. BREV. INT .....  
N° PCT/IT03/00494 .....  
NOME PROJECT SAS .....  
..... OPPOSIZIONE